between pinned layer **44** and free layer **48**. Permanent magnets **50**A and **50**B are each positioned adjacent to pinned layer **44** and to a corresponding side of spacer layer **46** and free layer **48**. Contacts **52**A and **52**B are positioned adjacent to free layer **48** and pinning layer **42**, respectively.

The magnetization of pinned layer **44** is fixed while the magnetization of free layer **48** rotates freely in response to an external magnetic field emanating from a magnetic medium. The magnetization of pinned layer **44** is pinned by exchange coupling pinning layer **42** with pinned layer **44**. The resistance of GMR stack **40** varies as a function of an angle that is formed between the magnetization of free layer **48** and the magnetization of pinned layer **44**. The GMR signal produced by GMR stack **40** is generated by a sense current flowing perpendicularly through the layers of GMR stack **40**.

Pinning layer **42** and pinned layer **44** each have a significantly greater number of structural grains (and thus a significantly greater lateral size) than free layer **48**. The lateral size of free layer **48** is typically about 4 square structural grains to about 9 square structural grains. The lateral size of pinning layer **42** and pinned layer **44** is typically about 64 square structural grains to about 100 square structural grains. This allows GMR stack **40** to exhibit a significantly lower fluctuation of magnetization than if pinning layer **42** and pinned layer **44** each had a similar lateral size to free layer **48**. In addition, because free layer **48** has a significantly smaller lateral size than pinning layer **42** and pinned layer **44**, GMR stack **40** exhibits a significantly higher spatial resolution than if free layer **48** had a similar lateral size to pinning layer **42** and pinned layer **44**.

GMR stack **40** would also function similarly if permanent magnets **50**A and **50**B were replaced by antiferromagnetic exchange tabs coupled to the outer regions of free layer **48**.

FIG. **4**B is a layer diagram of a fifth embodiment of a tunneling magnetoresistive (TMR) stack **40'** of the present invention. TMR stack **40'** is similar to GMR stack **40** of FIG. **4**A. Barrier layer **46'**, however, differs from spacer layer **46** of GMR stack **40** in that barrier layer **46'** is a nonmagnetic insulating material (instead of a nonmagnetic conducting material). The TMR signal produced by TMR stack **40'** is generated by a sense current flowing perpendicularly through the layers of TMR stack **40'**.

For both GMR stack **40** and TMR stack **40'**, permanent magnets **50**A and **50**B can be separated from pinned layer **44** using techniques similar to those in FIGS. **3**B and **3**C.

Although the present invention has been described with reference to preferred embodiments, workers skilled in the art will recognize that changes may be made in form and detail without departing from the spirit and scope of the invention.

What is claimed is:

1. A read sensor for use in a magnetic read head, the read sensor comprising:

a magnetoresistive stack having a plurality of layers; and

means for decreasing a fluctuation of magnetization in the read sensor without decreasing a spatial resolution of the read sensor, the means for decreasing a fluctuation of magnetization in the read sensor including a ferromagnetic pinned layer and an antiferromagnetic pinning layer each having a greater lateral size than a ferromagnetic free layer and each having a greater dimension extending perpendicular from an air bearing surface of the read sensor than the ferromagnetic free layer.

2. The read sensor of claim **1** wherein the means for decreasing a fluctuation of magnetization in the read sensor increases a pinning field direction dispersion in an antiferromagnetic pinning layer.

3. The read sensor of claim **1** wherein the means for decreasing a fluctuation of magnetization in the read sensor increases a number of structural grains in an antiferromagnetic pinning layer.

4. The read sensor of claim **1** wherein the pinned layer is a synthetic antiferromagnet.

5. The read sensor of claim **1** wherein the magnetoresistive stack is a giant magnetoresistive (GMR) stack configured to operate in a current-in-plane (CIP) mode wherein a sense current flows substantially parallel to a longitudinal plane of the layers of the stack.

6. The read sensor of claim **1** wherein the magnetoresistive stack is a giant magnetoresistive (GMR) stack configured to operate in a current-perpendicular-to-plane (CPP) mode wherein a sense current flows substantially perpendicular to a longitudinal plane of the layers of the stack.

7. The read sensor of claim **1** wherein the magnetoresistive stack is a tunneling magnetoresistive (TMR) stack configured to operate in a current-perpendicular-to-plane (CPP) mode wherein a sense current flows substantially perpendicular to a longitudinal plane of the layers of the stack.

8. A read sensor for use in a magnetic read head, the read sensor having a plurality of layers including:

a ferromagnetic free layer having a rotatable magnetic moment;

a ferromagnetic pinned layer having a fixed magnetic moment; and

an antiferromagnetic pinning layer positioned adjacent to the pinned layer, wherein the pinned layer and the pinning layer each have a greater lateral size than the free layer and have a greater dimension extending perpendicular from an air bearing surface of the read sensor than the free layer.

9. The read sensor of claim **8** wherein the pinned layer is a synthetic antiferromagnet.

10. The read sensor of claim **8** wherein the read sensor further includes a nonmagnetic spacer layer positioned between the free layer and the pinned layer.

11. The read sensor of claim **10** wherein the read sensor is a giant magnetoresistive (GMR) stack configured to operate in a current-in-plane (CIP) mode wherein a sense current flows substantially parallel to a longitudinal plane of the pinned layer.

12. The read sensor of claim **10** wherein the read sensor is a giant magnetoresistive (GMR) stack configured to operate in a current-perpendicular-to-plane (CPP) mode wherein a sense current flows substantially perpendicular to a longitudinal plane of the pinned layer.

13. The read sensor of claim **8** wherein the read sensor further includes a barrier layer positioned between the free layer and the pinned layer.

14. The read sensor of claim **13** wherein the read sensor is a tunneling magnetoresistive (TMR) stack configured to operate in a current-perpendicular-to-plane (CPP) mode wherein a sense current flows substantially perpendicular to a longitudinal plane of the pinned layer.

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